

CLAIMS

1. An apparatus for receiving and executing a plurality of commands, comprising:

a plurality of command queues for storing and ordering  
5 the plurality of commands as a plurality of command entries;

the plurality of commands are at least configured to have the ability to be dependent on one another;

the command entries further comprise:

an instruction;

10 a valid bit to at least indicate if a queue location is valid; and

at least one dependency bit to at least indicate any commands upon which the instruction is dependent.

15 2. The apparatus of Claim 1, wherein at least one command queue of the plurality of command queues is a strict order queue, wherein the strict order queue executes commands in an order of receipt into the strict order queue.

20 3. The apparatus of Claim 2, wherein the strict order queue further comprises:

a newest entry pointer, wherein the newest entry pointer at least indicates a subsequent valid queue location; and

an oldest entry pointer, wherein the oldest entry pointer at least indicates a next command for execution.

4. The apparatus of Claim 1, wherein at least one  
5 command queue of the plurality of command queues is a stack down order queue, wherein the stack down order queue at least is configured to have the ability to executes commands in any order.

10 5. The apparatus of Claim 4, wherein command entries of stack down order queue further comprise an at least one identification bit to at least individually identify each command entry.

15 6. The apparatus of Claim 1, wherein the plurality of command queues further comprise:

a strict order queue, wherein the strict order queue  
executes commands in an order of receipt into the strict  
order queue, and wherein the strict order queue further  
20 comprises:

a newest entry pointer, wherein the newest entry  
pointer at least indicates a subsequent valid queue  
location; and

an oldest entry pointer, wherein the oldest entry pointer at least indicates a next command for execution; and

a stack down order queue, wherein the stack down order queue at least is configured to have the ability to executes commands in any order, and wherein command entries of stack down order queue further comprise an at least one identification bit to at least individually identify each command entry.

10

7. A method for entering at least one command into a plurality of command queues, comprising:

determining which command queue of the plurality of command queues at least corresponds to the at least one command;

15

entering the at least one command into the command queue that corresponds;

upon entering the at least one command, taking a snapshot of the order of each of the plurality of command queues;

20

updating a valid bit to indicate that a queue location is valid;

determining if the command is dependent on any other commands to indicate if dependencies exist; and

if any dependencies exist, updating at least one dependency in a dependency bit.

8. The method of Claim 7, wherein at least one  
5 command queue of the plurality of command queues is a strict order queue.

9. The method of Claim 8, wherein the method further comprises if the command at least corresponds to the strict  
10 order queue, entering the at least one command into the strict order queue in a location indicated by a newest entry pointer.

10. The method of Claim 7, wherein at least one  
15 command of the plurality of command queues is a stack down order queue.

11. The method of Claim 10, wherein the method further comprises:

20 if the command at least corresponds to the stack down order queue, entering the at least one command into the stack down order queue; and

upon entering, updating an identification bit to at least track the command.

25

12. A method for executing at least one command from at least one command queue of a plurality of command queues, comprising:

determining a next command to execute;  
5 executing the next command;  
generating a retire signal; and  
updating corresponding commands.

13. The method of Claim 12, wherein the retire signal  
10 further comprises command identification.

14. The method of Claim 13, wherein updating corresponding commands further comprises:

clearing any dependencies on the executed command in  
15 any corresponding command; and  
clearing a valid bit to indicate a next valid queue location.

15. A computer program product for entering at least  
20 one command into a plurality of command queues, the computer program product having a medium with a computer program embodied thereon, the computer program comprising:

computer program code for determining which command queue of the plurality of command queues at least  
25 corresponds to the at least one command;

computer program code for entering the at least one command into the command queue that corresponds;

upon entering the at least one command, computer program code for taking a snapshot of the order of each of  
5 the plurality of command queues;

computer program code for updating a valid bit to indicate that a queue location is valid;

computer program code for determining if the command is dependent on any other commands to indicate if dependencies  
10 exist; and

if any dependencies exist, computer program code for updating at least one dependency in a dependency bit.

16. The computer program product of Claim 15, wherein  
15 at least one command queue of the plurality of command queues is a strict order queue.

17. The computer program product of Claim 16, wherein the computer program product further comprises if the  
20 command at least corresponds to the strict order queue, computer program code for entering the at least one command into the strict order queue in a location indicated by a newest entry pointer.

18. The computer program product of Claim 15, wherein at least one command of the plurality of command queues is a stack down order queue.

5        19. The computer program product of Claim 18, wherein the method further comprises:

if the command at least corresponds to the stack down order queue, computer program code for entering the at least one command into the stack down order queue; and

10        upon entering, computer program code for updating an identification bit to at least track the command.

20. A computer program product for executing at least one command from at least one command queue of a plurality  
15 of command queues, the computer program product having a medium with a computer program embodied thereon, the computer program comprising:

computer program code for determining a next command to execute;

20        computer program code for executing the next command;  
computer program code for generating a retire signal;  
and

computer program code for updating corresponding commands.

25

21. The computer program product of Claim 20, wherein the computer program code for retire signal further comprises computer program code for command identification.

5        22. The computer program product of Claim 21, wherein computer program code for updating corresponding commands further comprises:

computer program code for clearing any dependencies on the executed command in any corresponding command; and

10       computer program code for clearing a valid bit to indicate a next valid queue location.

23. A processor for entering at least one command into a plurality of command queues having computer program code,  
15 the computer program comprising:

computer program code for determining which command queue of the plurality of command queues at least corresponds to the at least one command;

computer program code for entering the at least one  
20 command into the command queue that corresponds;

upon entering the at least one command, computer program code for taking a snapshot of the order of each of the plurality of command queues;

computer program code for updating a valid bit to  
25 indicate that a queue location is valid;



computer program code for determining if the command is dependent on any other commands to indicate if dependencies exist; and

if any dependencies exist, computer program code for  
5 updating at least one dependency in a dependency bit.

24. The computer program code of Claim 23, wherein at least one command queue of the plurality of command queues is a strict order queue.

10

25. The computer program code of Claim 24, wherein the computer program code further comprises if the command at least corresponds to the strict order queue, computer program code for entering the at least one command into the  
15 strict order queue in a location indicated by a newest entry pointer.

26. The computer program code of Claim 23, wherein at least one command of the plurality of command queues is a  
20 stack down order queue.

27. The computer program code of Claim 26, wherein the computer program code further comprises:

if the command at least corresponds to the stack down order queue, computer program code for entering the at least one command into the stack down order queue; and

upon entering, computer program code for updating an  
5 identification bit to at least track the command.

28. A processor for executing at least one command from at least one command queue of a plurality of command queues having computer program code, the computer program  
10 code comprising:

computer program code for determining a next command to execute;

computer program code for executing the next command;

computer program code for generating a retire signal;

15 and

computer program code for updating corresponding commands.

29. The computer program code of Claim 28, wherein the  
20 computer program code for retire signal further comprises computer program code for command identification.

30. The computer program code of Claim 29, wherein computer program code for updating corresponding commands  
25 further comprises:

computer program code for clearing any dependencies on  
the executed command in any corresponding command; and

computer program code for clearing a valid bit to  
indicate a next valid queue location.

5